

What is claimed is:

- 1           1.     A method of routing Signaling System 7 (SS7) signaling traffic over an  
2     Internet Protocol (IP) network comprising the steps of:  
3                 a first signaling gateway (SG) receiving SS7 signaling traffic from a first  
4     signaling point;  
5                 the first SG transferring the SS7 signaling traffic over said IP network by  
6     routing the traffic in an IP message stream to a second SG supporting peer-to-  
7     peer signaling with said first SG over said IP network; and  
8                 the second SG receiving said IP message stream and recovering the SS7  
9     traffic from the IP message stream.
- 1           2.     The method of claim 1 further comprising the step of using a Network  
2     Indicator (NI) and a Destination Point Code (DPC) to determine how to route the  
3     SS7 signaling traffic over said IP network.
- 1           3.     The method of claim 2 wherein the step of using a NI and a DPC to  
2     determine how to route the SS7 signaling traffic is preceded by the step of global  
3     title translation to reveal the DPC of the signaling traffic.
- 1           4.     The method of claim 1 further comprising the step of the second SG  
2     transmitting the SS7 signaling traffic to a second signaling point.
- 1           5.     The method of claim 1 further comprising the step of said first and second  
2     SGs utilizing Message Transfer Part 3-User Adaptation Layer (M3UA) protocol to  
3     support peer-to-peer signaling.

1 6. The method of claim 5 further comprising the step of said first and second  
2 SGs utilizing SCTP protocol to support peer-to-peer signaling.

1 7. The method of claim 6 further comprising the step of said first and second  
2 SGs using SCTP associations for passing IP traffic.

1 8. The method of claim 7 further comprising the step of using said SCTP  
2 associations for passing management-related messages between said first and  
3 second SG.

1 9. The method of claim 8 further comprising the step of using Stream Control  
2 Transfer Protocol (SCTP) associations for passing destination availability  
3 messages between said first and second SG.

1 10. The method of claim 1 further comprising the step of said first SG using  
2 SCCP protocol to translate the global title of said SS7 signaling traffic to a  
3 destination.

1 11. The method of claim 10 further comprising the step of routing said SS7  
2 traffic using the destination revealed after global title translation.

1 12. A signaling gateway for routing Signaling System 7 (SS7) signaling traffic  
2 over an Internet Protocol (IP) backbone comprising:

3 an SS7 interface to an SS7 signaling link;

4 an IP interface to an IP signaling link; and

5 conversion means between said SS7 interface and said IP interface for  
6 converting SS7 signaling traffic received from said SS7 signaling link to IP traffic  
7 suitable for transmission over said IP signaling link.

1 13. The signaling gateway of claim 12 wherein said conversion means  
2 comprises SS7 to IP conversion layers.

1 14. The signaling gateway of claim 13 wherein said SS7 to IP conversion  
2 layers include SCTP and Message Transfer Part 3-User Adaptation Layer  
3 (M3UA) protocols layers.

1 15. The signaling gateway of claim 14 wherein said SCTP and  
2 M3UA permit routing of SS7 signaling traffic over said IP signaling link based on  
3 the Network Indicator and Destination Point Code of said traffic.

1 16. The signaling gateway of claim 14 wherein said SS7 to IP conversion  
2 layers include an SCCP protocol layer.

1 17. The signaling gateway of claim 16 wherein said SCCP protocol layer  
2 permits global title translation of said SS7 signaling traffic to a destination point  
3 code.

1 18. A system for routing Signaling System 7 (SS7) signaling traffic over an  
2 Internet Protocol (IP) network comprising:

3 two or more signaling points, each signaling point capable of sending and  
4 receiving SS7 signaling traffic over an SS7 network;

5 a first Signaling Gateway (SG) adapted for receiving SS7 signaling traffic  
6 from a first signaling point over said SS7 network, said first SG configured to  
7 convert SS7 signaling traffic into an IP message stream and to route said IP  
8 message stream on said IP network;

9 a second SG configured to receive said IP message stream via peer-to-  
10 peer IP communications over said IP network with said first SG and to recover  
11 said SS7 signaling traffic from said IP message stream, said second SG adapted  
12 to route recovered SS7 signaling traffic to a specific second signaling point on  
13 said SS7 network.

1 19. The system of claim 18 wherein at least one of said signaling points is an  
2 SS7 Signaling Transfer Point (STP).

1 20. The system of claim 18 wherein at least one of said signaling points is an  
2 SS7 Signaling End Point (SEP).

1 21. The system of claim 20 wherein said SEP is an SS7 Service Switch Point  
2 (SSP).

1 22. The system of claim 20 wherein said SEP is an Mobile Switching Center.

1 23. The system of claim 18 wherein said first SG is further configured to use a  
2 Network Indicator (NI) and a Destination Point Code (DPC) to determine how to  
3 route said signaling traffic.

1 24. The system of claim 23 wherein said first SG uses Global Title Translation  
2 to determine said DPC.

1 25. The system of claim 18 wherein said first and second SG share the same  
2 Destination Point Code (DPC) thereby conserving DPCs.

1 26. The system of claim 18 wherein said first SG uses a Stream Control  
2 Transfer Protocol (SCTP) to transport said IP message stream over said IP  
3 network.

1 27. The system of claim 18 wherein said first SG uses a Message Transfer  
2 Part 3-User Adaptation Layer (M3UA) to transport said SS7 signaling traffic in  
3 said IP message stream over said IP network.

1 28. The system of claim 27 wherein said first SG uses a Nodal Interworking  
2 Function (NIF) layer to exchange SS7 signaling traffic between a Message  
3 Transfer Part (MTP) 3 layer and said M3UA layer.

1 29. The system of claim 18 wherein said second SG uses a Stream Control  
2 Transfer Protocol (SCTP) to receive said IP message stream over said IP  
3 network.

1 30. The system of claim 18 wherein said second SG uses a Message  
2 Transfer Part 3- User Adaptation Layer (M3UA) to recover said SS7 signaling  
3 traffic from said IP message stream.

1 31. The system of claim 30 wherein said second SG uses a Nodal  
2 Interworking Function (NIF) layer to exchange SS7 signaling traffic between a  
3 Message Transfer Part (MTP) 3 layer and a Message Transfer Part 3-User  
4 Adaptation Layer (M3UA) layer.

1 32. The system of claim 18 wherein said first SG is configured to recover SS7  
2 signaling traffic from said IP message stream.

1 33. The system of claim 18 wherein said second SG is configured to convert  
2 SS7 signaling traffic into said IP message stream.